REMARKS

Claims 1 through 21 and new Claim 22 are pending in the application.

Claim 1 has been amended to emphasize advantageous methods in which the cellulose tubing is pre-dried to a moisture of about 30 to about 70 % of the moisture of the wet tubing, resulting in tubing having up to a 30 % higher bursting pressure in comparison to a non-predried tubing. Support for this amendment can be found in the Application-as-filed, for example in Claim 2 as-filed and on Page 8, lines 6 through 9.

Claim 2 has been canceled, as its subject matter has been incorporated into Claim 1.

Claim 4 has been amended to conform to claim 1 as-amended.

Claims 12 through 21, directed to non-elected aspects of the invention, have been withdrawn.

Claim 22 has been added to complete the record for examination and highlight particularly advantageous embodiments of the invention.

Claim 22 reflects advantageous methods further comprising impregnating the predried cellulose tubing with an impregnation solution having about 2 % by weight of a distearyl diketene before drying. Support for Claim 22 can be found in the Application-as-filed, for example on Page 10, lines 10 through 20 and Claim 21 as-filed.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

Objections to the Specification

Page 7 stands objected to over the phrase "claims 7 to 11" and "claims 15 to 21." Applicants respectfully submit that the foregoing phrases have been removed from the specification. Accordingly, Applicants respectfully request withdrawal of the foregoing objections.

The Claimed Invention is Patentable

in Light of the Art of Record

. Claims 1 through 3 and 5 through 11 stand rejected over WIPO Published Application No. 03/000060 to Gord et al. whose United States equivalent is United States Application Publication No. 2004/0166209 (US 209) in view of United States Patent No. 2,176,925 to Reichel et al (US 925). Claim 4 stands rejected over the foregoing references, and further in view of United States Patent No. 2,901,358 to Underwood et al. (US 358).

It may be helpful to briefly consider the invention before addressing the merits of the rejection.

Edible casings must ultimately provide a challenging balance of properties. In order to be readily chewable, the tubular casing must have a low wet strength and must not be very tough. Conversely, the tubular casing must have sufficient strength to survive processing. Tensile properties within tubular casings are commonly imparted via casing inflation, in which gas is used to expand the tubing. To survive inflation, the casing must possess the contradictory properties of elasticity and toughness. The extremely gentle processing conditions associated for heretofore known casings, i.e. casings having excessively low wet strength, have imparted lower tensile properties and caliber inconsistencies. Consequently, conventional edible casings to-date are oriented using quite moderate air pressure, resulting in less orientation of the polymer chains and suppressed physical properties.

Applicants have found that by pre-drying edible casings to a recited moisture content a significantly higher wet strength can be imparted, without undue sacrifice to its ability to inflate or the resulting edible casing properties.

Applicants have further determined that the inventive pre-dried casings may be impregnated to impart additional effects, such as improved sausage emulsion adhesion, pre-smoking or the like. As a result of the recited pre-drying, the uptake capacity of the tubing for the impregnation solution is significantly higher. Furthermore, the mass diffusion of the impregnation solution is shifted, resulting in the impregnation solution concentration remaining constant for a longer period of time.

Accordingly, the claims as-amended are directed to methods for producing edible cellulose tubing in which a solution of the underivatized cellulose in tertiary amine N-oxide, additives and water is extruded from an annular die into a water bath, cleaning the cellulose tubing, and passing the tubing through at least two wash sections and one plasticizing section, predrying the wet tubing in the laid-flat state to a moisture of about 30 to 70 % of the moisture of the wet tubing, and drying the pre-dried tubing to its final moisture content, with the resulting tubing exhibiting up to a 30 % higher bursting pressure in comparison to a non-predried tubing.

Beneficially, the pre-drying is accomplished by passing the cellulose tubing vertically through a predrying zone, particularly passing the cellulose tubing vertically two times by being turned round by 180° at one end of the predrying zone, as recited Claim 7

Advantageously, the inventive method further comprises impregnating the pre-dried cellulose tubing with an impregnation solution having about 2 % by weight of a distearyl diketene before drying, as recited in newly added Claim 22.

Applicants respectfully submit that the cited references do not teach or suggest the claimed invention.

US 209 is generally directed to edible packaging film including a protein as a filler. (Page 1, Paras. 0011 and 0012). US 209, evidencing conventional wisdom, teaches that in the wet state, its films have "only a very low load-bearing capacity," and thus the process must "operate in a particularly gentle manner." (Page 3, Para. 0024). US 209 merely generically notes that its films may be dried to an undisclosed level prior to inflation. (Page 3, Para. 0024). US 209 goes on to teach that inflation sets "important properties," such as strength and caliber constancy. (Page 3, Para. 0024). The working example indicates that the film is preliminarily dried while "floating horizontally" to an undisclosed moisture content. (Page 3, Para. 0031).

US 209, generically noting preliminary drying, does not teach or suggest that predrying cellulose tubing to a moisture of about 30 to about 70 % of the moisture of the wet tubing would result in an up to a 30 % higher bursting pressure in comparison to a non-predried tubing. Nor would there have been any motivation for US 209 to have determined the recited moisture content, as US 209 does not recognize drying as a result-effective-variable in casing burst strength.

US 209, expressly teaching horizontal drying, also fails to teach or suggest drying cellulose tubing by passing it vertically through a predrying zone, much less passing vertically two times by being turned round by 180° at one end of the predrying zone, as recited Claim 7

And US 209 most certainly does not teach or suggest applying an impregnation solution is applied to the inside of the predried tubing, as recited in Claim 4.

US 209 thus can not teach or suggest inventive methods including impregnating the pre-dried cellulose tubing with an impregnation solution having about 2 % by weight of a distearyl diketene before drying, as recited in newly added Claim 22.

Accordingly, Applicants respectfully submit that US 209 does not teach or suggest the claimed invention.

US 925 does not cure the deficiencies in US 209.

US 925 is directed to flexible tubing formed from cellulose derivative. (Col. 2, lines 40 – 45). US 925 notes that cellulose containing solvent is "so soft as to be incapable of being stretched to the amount necessary." (Col. 4, lines 39 – 46). To impart greater toughness, US 925 incorporates a "conditioning agent," such as ethyl alcohol, which prevents the tubing from contracting. (Col. 4, lines 46 – 52 and Col. 4, line 75 – Col. 5, line 3). The conditioning agent may either be added to the coagulation bath or applied immediately thereafter. (Col. 5, lines 11 – 16). In contrast to the recited methods, US 925 washes and plasticizes its tubing subsequent to inflation. (Col. 9, lines 3 – 13 and lines 50 – 60; Col. 10, lines 42 – 47 and Col. 11, lines 12). US 925 generically notes that "heat" may be used during stretching to plasticize the tubing. (Col. 9, lines 25 – 38). US 925 expressly teaches drying the tube subsequent to inflation. (Col. 9, lines 8 – 11).

US 925, silent as to pre-drying and generically teaching drying after inflation, does not teach or suggest that predrying cellulose tubing to a moisture of about 30 to about 70 % of the moisture of the wet tubing would result in an up to a 30 % higher bursting pressure in comparison to a non-predried tubing.

Nor does US 925 teach or suggest drying cellulose tubing by passing it vertically through a predrying zone, much less passing vertically two times by being turned round by 180° at one end of the predrying zone, as recited Claim 7

And US 925, teaching application of its conditioning agent within the coagulation bath, most certainly does not teach or suggest applying an impregnation solution is applied to the inside of the predried tubing, as recited in Claim 4.

US 925 thus can not teach or suggest inventive methods including impregnating the pre-dried cellulose tubing with an impregnation solution having about 2 % by weight of a distearyl diketene before drying, as recited in newly added Claim 22.

Accordingly, Applicants respectfully submit that US 925 does not teach or suggest the claimed invention.

There would have been no motivation to have combined US 209 and US 925.

However, even if US 209 and US 925 were combined (which Applicants did not do), the claimed invention would not have resulted.

The combination does not teach or suggest that predrying cellulose tubing to a moisture of about 30 to about 70 % of the moisture of the wet tubing would result in an up to a 30 % higher bursting pressure in comparison to a non-predried tubing. US 209 merely generically notes pre-drying. US 925, silent as to predrying, teaches drying subsequent to inflation.

Nor does the combination teach or suggest drying cellulose tubing by passing it vertically through a predrying zone, much less passing vertically two times by being turned round by 180° at one end of the predrying zone, as recited Claim 7.

And the combination most certainly does not teach or suggest applying an impregnation solution is applied to the inside of the pre-dried tubing, as recited in Claim 4. In fact, Applicants respectfully submit that the application of an impregnation solution to tubing which has just had liquid removed is counter-intuitive, at best.

The combination thus can not teach or suggest inventive methods including impregnating the pre-dried cellulose tubing with an impregnation solution having about 2 % by weight of a distearyl diketene before drying, as recited in newly added Claim 22.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 209 and US 925 considered either alone or in any combination with the remaining art of record.

Claim 4 is likewise patentable in further light of US 358.

US 358 is directed to readily removable casings. (Col. 1, lines 15 – 20). US 358 merely teaches the conventional coating of casings prior to inflation. (Col. 2, lines 17 – 24). US 358 teaches that the sausage casing is a gel during coating "to assure a more uniform product." (Col. 2, lines 54 – 56). US 358 expressly notes that its solutions are applied "prior to drying." (Col. 3, lines 45 – 50).

US 358 does not teach or suggest that predrying cellulose tubing to a moisture of about 30 to about 70 % of the moisture of the wet tubing would result in an up to a 30 % higher bursting pressure in comparison to a non-predried tubing.

And US 358, requiring a gel-casing to assure uniformity, most certainly does not teach or suggest applying an impregnation solution is applied to the inside of the pre-dried tubing, as recited in Claim 4. The Office Action's urgings at Page 6 that the "squeeze rolls" of US 358 are a method of pre-drying is conjecture. US 358 merely impedes super-saturated liquids clinging to casing surface, i.e. "solution carry over" from entering the next process step. US 358 clearly indicates that the casing remains in a gel form during coating.

There likewise would have been no motivation to have combined US 209, US 925 and US 358.

However, even if US 209, US 925 and US 358 were combined (which Applicants did not do), the claimed invention would not have resulted.

The combination does not teach or suggest that predrying cellulose tubing to a moisture of about 30 to about 70 % of the moisture of the wet tubing would result in an up to a 30 % higher bursting pressure in comparison to a non-predried tubing. US 209 merely generically notes pre-drying. US 925, silent as to predrying, teaches drying subsequent to inflation. US 358 merely teaches conventional drying during inflation.

And the combination most certainly does not teach or suggest applying an impregnation solution is applied to the inside of the pre-dried tubing, as recited in Claim 4. In fact, US 358 teaches away from the recited pre-drying prior to impregnation by instead requiring the casing to be in a gel-form to assure uniformity during coating.

Accordingly, Applicants respectfully submit that Claim 4 is patentable in light of US 209, US 925 and US 358, considered either alone or in any combination with the remaining art of record.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1 and 3 through 22 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,

Cathy Moore

Cathy R. Moore
Reg. No. 45,764

ProPat, L.L.C.
425-C South Sharon Amity Road
Charlotte, NC 28211-2841
Telephone: (704) 365-4881
Fax: (704) 365-4851
Customer No. 38263

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Claire Wygand Claire Wygand